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EXAMINER

MARIAM, DANIEL G

| ART UNIT | PAPER NUMBER |
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2621

DATE MAILED: 09/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/894,272

Applicant(s)

SCHMIDT ET AL.

Examiner

DANIEL G MARIAM

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 21-41, 48-52 and 59-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 42-44, 46 and 53-58 is/are rejected.
- 7) ☒ Claim(s) 45 and 47 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 09212004.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention: species I, Figures 1-3, 6 & 11 (corresponding to claims 1-20, 42-47, and 53-58); and species II, Figures 1-2, 4-5 & 7-10 (corresponding to claims 21-41, 48-52, and 59-63).

2. During a telephone conversation with Jeffrey C. Hood on September 22, 2004 a provisional election was made with traverse to prosecute the invention of species I, claims 1-20, 42-47, and 53-58. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-41, 48-52, and 59-63 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant's election with traverse of species I is acknowledged. The traversal is on the ground(s) that the species are not patentably distinct. Applicant has not submitted evidence or identifies such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. The Examiner has assumed the traversal is on the ground(s) that claim 1 is generic to claims 21, 41, 42, 48, 53, and 59 since applicant has not indicate a reason for the traversal. This is not found to be persuasive because the limitation recited in claim 1 is not generic. For example, claim 1, step (d) requires "if said first test results meet first criteria, outputting information regarding the curve, wherein the curve comprises a detected edge in the image". None of the above-identified claims require this feature. The requirement is still deemed proper and is therefore made FINAL.

Oath/Declaration

4. While the Declaration identifies the citizenship of one of the inventors, namely (Ram Rajagopal) as "Brazil" by crossing out "USA", the modification has not been initialized and dated. Accordingly, a supplemental oath or declaration is required when responding to this action reflecting the change made to the citizenship.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 53-58 are rejected under 35 U.S.C. 101 because the claimed subject matter is directed to non-statutory subject matter. Claim 53 is directed to neither a "process" nor a "machine," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only (SEE MPEP 2173.05 (P, II)).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. While claim 1 recites, the limitation "a computer-implemented method for. ." claim 2 recites the limitation "the method of claim 1" in line 1. Likewise, a similar limitation occurs in line 1 of claims 2-20. There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1-7, 10-17, 20, 42-44, 46, 53-55, and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer, et al. (5,081,689) in view of Roth (5,617,491).

With regard to claim 1, Meyer, et al. (hereinafter "Meyer") discloses a computer-implemented method for performing edge detection in an image comprising a plurality of pixels (See for example, Fig. 5), the method comprising: a) receiving the plurality of pixels (See for example, col. 3, lines 27-42); b) generating a curve, i.e., intensity curve, based on two or more (random) pixels of the plurality of pixels, i.e., intensity pixel points (See for example, Figure 2); c) testing, i.e., comparing/checking, the curve against a first subset of the plurality of pixels, i.e., the level of intensity at a first/second curvature extrema and/or average intensity change, wherein said testing produces first test results, i.e., exceeding or not exceeding a predetermined threshold (See for example col. 5, lines 4-32); d) if said first test results meet first criteria, i.e., the results obtained by comparing/checking exceeds a predetermined threshold, outputting information regarding the curve, wherein the curve comprises a detected edge in the image, i.e., confirming the existence of an edge (See for example, col. 5, lines 8-9). While Meyer's geometric element, i.e., curve, is created from successive pixels (as shown in Fig. 2), Meyer does not expressly call for generating the curve from random pixels. However, Roth (See for example, Figs. 2-3; and Abstract) teaches this feature. Therefore, it would have been obvious to one having ordinary

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skill in the art to incorporate the teaching as taught by Roth into the system of Meyer, if for no other reason than to enable the system of Meyer create the curve using pixels that are arranged in a random fashion.

With regard to claim 2, the method of claim 1, wherein the method comprises performing (b) and (c) a plurality of times to determine a curve which meets the first criteria (See for example, col. 5, lines 41-43 of Meyer).

With regard to claim 3, the method of claim 2, wherein said performing (b) and (c) a plurality of times comprises performing (b) and (c) in an iterative, i.e., repetitive, manner until ending criteria are met (See for example, col. 5, lines 41-43 of Meyer).

With regard to claim 4, the method of claim 3, wherein said ending criteria comprise one or more of: the number of iterations meeting or exceeding an iteration threshold; and a number of pixels of the plurality of pixels within a specified pixel radius of the curve meeting or exceeding a specified minimum value (See col. 5, lines 7-43; and Fig. 2 of Meyer).

With regard to claim 5, the method of claim 1, further comprising: pre-testing the curve against a second subset of the plurality of pixels, wherein said testing produces second test results; wherein, if said second test results meet second criteria, then performing c) and d) (which reads on col. 5, lines 33-43 of Meyer).

With regard to claim 6, the method of claim 5, wherein the second subset is smaller than the first subset (which reads on Fig. 3 of Meyer compared to the entire pixels shown in Fig. 2).

With regard to claim 7, the method of claim 5, wherein the second subset is a random subset comprising randomly selected pixels from the plurality of pixels (See for example, Abstract of Roth).

With regard to claim 10, the method of claim 5, wherein said pre-testing the curve against a second subset of the plurality of pixels comprises: determining a number of the second subset of the plurality of pixels which are within the specified pixel radius of the curve, wherein said second test results comprise said number of the second subset of the plurality of pixels which are within the specified pixel radius of the curve (which reads on Figs. 2 and 3 of Meyer; and col. 2, lines 40-61 of Roth).

With regard to claim 11, the method of claim 10, wherein said second criteria comprise said number of the second subset of the plurality of pixels which are within the specified pixel radius of the curve meeting or exceeding a threshold value (See for example, Figs. 2 & 3 of Meyer).

With regard to claim 12, the method of claim 10, wherein said second criteria comprise said number of the second subset of the plurality of pixels which are within the specified pixel radius of the curve meeting or exceeding a specified fraction of the second subset (which reads on Fig. 3 of Meyer).

With regard to claim 13, the method of claim 1, wherein said testing the curve against a first subset of the plurality of pixels comprises: determining a number of the first subset of the plurality of pixels which are within the specified pixel radius of the curve, wherein said first test results comprise said number of the first subset of the plurality of pixels which are within the

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specified pixel radius of the curve (which reads on Figs. 2 and 3 of Meyer; and col. 2, lines 40-61 of Roth).

With regard to claim 14, the method of claim 13, wherein said first criteria comprise said number of the first subset of the plurality of pixels which are within the specified pixel radius of the curve meeting or exceeding a specified fraction of the first subset (which reads on Fig. 3 of Meyer).

With regard to claim 15, the method of claim 1, wherein the first subset comprises substantially all of the plurality of pixels (See Fig. 2 of Meyer).

With regard to claim 16, the method of claim 1, wherein said outputting information comprises displaying the generated curve on a display device (See item 36, in Fig. 5 of Meyer).

With regard to claim 17, the method of claim 1, wherein the curve comprises one of a line, a circle, and an ellipse (See Figs. 2 & 3 of Meyer; and Fig. 4b of Roth).

With regard to claim 20, the method of claim 1, wherein the image has a dimensionality greater than two (See for example, col. 4, lines 17-38 of Roth).

Claim 42 is rejected the same as claim 1. Thus, argument analogous to that presented above for claim 1 is applicable to claim 42. Meyer further discloses a memory medium operable to store program instructions for performing edge detection in a received image (See Fig. 5 of Meyer).

Claims 43 and 44 are rejected the same as claims 2 and 5 respectively. Thus, arguments similar to those presented above for claims 2 and 5 are respectively applicable to claims 43 and 44.

Claim 46 is rejected the same as claims 10, 11, and 13. Thus, arguments similar to those presented above for claims 10, 11, and 13 are applicable to claim 46.

Claim 53 is rejected the same as claim 1 except claim 53 is directed to both apparatus and method claims. Thus, argument similar to that presented above for claim 1 is equally applicable to claim 53. Furthermore, applicant's attention is invited to Figure 5 of Meyer.

Claims 54 and 55 are rejected the same as claims 2 and 5 respectively. Thus, arguments similar to those presented above for claims 2 and 5 are respectively applicable to claims 54 and 55.

Claim 57 is rejected the same as claims 10, 11, and 13. Thus, arguments similar to those presented above for claims 10, 11, and 13 are applicable to claim 57.

Allowable Subject Matter

11. Claims 45 and 47 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art to Meyer, et al. (as modified by Roth) do not teach or fairly suggest randomizing the plurality of pixels after said receiving to generate a randomized list of the plurality of pixels; wherein said randomly selected pixels from the plurality of pixels are selected by traversing the randomized list; and performing a refined curve fit, wherein the refined curve fit is performed using a second subset of the plurality of pixels

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comprising pixels within said specified pixel radius of the curve, wherein the refined curve fit comprises iteratively culling outlying pixels from the second subset, generating a culled subset of pixels, and fitting a refined curve to the culled subset at each iteration until an ending condition is met, wherein the refined curve fit generates a refined curve, and generating output, comprising one or more of information regarding the refined curve, and the culled subset of the plurality of pixels, wherein the curve comprises a refined detected edge in the image. It is for these reasons and in combination with all of the elements of the base claim that claims 45 and 47 would be allowable over the prior art of Meyer, et al. (as modified by Roth), if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion


12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent Numbers: 5199082, **5339367** and **6690842**; and a publication to: Hata, et al. "**Automatic extraction and tracking of contours**"; and Dougherty, et al. "ROC Curve evaluation of edge detector performance".

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G MARIAM whose telephone number is 703-305-4010. The examiner can normally be reached on M-F (7:00-4:30) FIRST FRIDAY OFF.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, LEO BOUDREAU can be reached on 703-305-4607. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


DANIEL MIRIAM
PRIMARY EXAMINER
September 22, 2004